AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claim 1 (Currently Amended): Method for an automatic determination of physical, technical method and/or colloidal chemistry parameters by a determination of an attenuation of radiated waves during a segregation of monodisperse or polydisperse dispersion samples subjected to gravitation or centrifugation, comprising:

(a) during the segregation by centrifugation or gravitation, repeatedly determining and recording momentary transmission values $I_T(t, r)$ characterizing a current segregation status of the waves radiated with intensity values $I_o(t, r)$ and/or instantaneous scattering values $I_S(t, r)$ as a function of a position r within the samples at a time t, for one or more wavelengths over the entire length of each sample or in selected partial sections of each sample, simultaneously for multiple samples;

(b) calculating an extinction profile $E_T(t, r)$ by finding a log of a ratio of $I_o(t, r) / I_T(t, r)$ for a determination of a particle or droplet concentration for the dispersion samples as a function of sample position and time;

(c) from the extinction profiles $E_T(t, r)$ determined at different times and a local adjustment made in time segments, calculating segregation speeds for any constant extinction values;

(d) from a ratio of the segregation speeds determined for specific extinction percentiles, calculating a polydispersity index, which is characteristic for the polydispersity of the density or a particle or droplet size **[[;]]**

~~(e) optionally, calculating extinction-weighted distributions of the particle or droplet size from extinction profiles $E_T(t, r)$ for selectable times while standardizing on the maximum extinction for this profile;~~

~~(f) optionally, calculating the cumulative volume-weighted distributions of the particle or droplet size from any extinction profiles acquired at time t according to (b), wherein~~

~~(1) the volume-specific extinction cross section that is dependent on particle size is calculated according to Mie theory while including the device constants from known optical parameters of the samples, or~~

~~(2) the volume-specific extinction cross section that is dependent on particle size is determined if the extinction of at least two monodisperse reference samples is determined corresponding to (b), or~~

~~(3) the volume-specific extinction cross section that is dependent on particle size is determined if the course of the extinction is determined during the segregation of at least one polydisperse substance system with similar optical characteristics corresponding to (b);~~

~~(g) optionally, using the volume-weighted distribution of particle or droplet sizes determined in (f) and the particle size dependency for the volume-specific extinction cross section determined in (f)(1), (f)(2) or (f)(3), assigning each radial position and the particle size associated with it a volume concentration;~~

~~(h) optionally, determining the flux density function standardized to the centrifugation constant from the change in the concentration of the samples with known starting concentration;~~

~~(i) optionally, determining the concentration-dependent hindrance function for the substance system;~~

~~(j) optionally, determining the volume-weighted distribution of the Stokes equivalent diameter for the case of hindrance functions not equal to 1 until the difference between the concentration profiles of consecutive steps are less than a value to be provided in advance, or if the allowance for the hydrodynamic impediment is provided by a mathematical algorithm~~.

Claim 2 (Previously Presented): Method according to claim 1, wherein the particle or droplet sizes and their distribution are determined.

Claim 3 (Previously Presented): Method according to claim 1, comprising determining the extinction profile as a function at a freely selectable position or over a range of the sample, and the distribution of particle or droplet sizes is calculated from the extinction profile.

Claim 4 (Previously Presented): Method according to claim 1, comprising calculating the apparent relative viscosity as a function of the concentration by volume from the hindrance function, taking into account the concentration by volume.

Claim 5 (Previously Presented): Method according to claim 1, comprising determining the sedimentation type and the critical concentration by volume for the use of consolidation phenomena from the change in the segregation speed during the segregation.

Claim 6 (Previously Presented): Method according to claim 1, comprising increasing the ascertainable range of the particle or droplet size distribution as well as the resolution with respect to the distribution of particle or droplet sizes by varying the number of revolutions and the measurement time intervals.

Claim 7 (Previously Presented): Method according to claim 1 wherein the mass density distribution of the sample is calculated from the extinction profile $E_T(t, r)$ for a known distribution of particle sizes.

Claim 8 (Previously Presented): Method according to claim 1 wherein for mixtures of substances of different densities, the distribution of particle or droplet sizes for the individual substance components is calculated from the extinction profiles for the segregation of dispersions with different densities for the dispersion medium.

Claim 9 (Previously Presented): Method according to claim 1, comprising computing indices for the consolidation behavior of the dispersion samples from the sediment levels for gradually changed revolutions related to the respective operative centrifugal force.

Claim 10 (Previously Presented): Method according to claim 1 wherein the control of the segregation analyzer and the measurement sensor, including radiation source, sample management and data transfer, data handling and data storage, as well as all steps of analysis and the documentation of the results, takes place by software supported by a database.

Claim 11 (Previously Presented): Device for an automatic determination of physical, technical method and/or colloidal chemistry parameters, comprising a PC-controlled multi-sample receptacle unit arranged vertically or horizontally with a spectrometric measurement device with a source producing monochromatic parallel radiation, which registers, digitizes and stores the radiation intensity scattered or transmitted by the respective dispersion sample over the entire length of the sample simultaneously or shifted temporally during segregation, resolved for location and time.

Claim 12 (Previously Presented): Device according to claim 11, wherein different cuvettes matched to the measurement task and/or the dispersion sample with respect to the optical path length and the materials can be used, the cuvette type is detected automatically, and the parameters required for the analysis of the measurement results are automatically made available via database entries for the calculation of the parameters to be analyzed.

Claim 13 (Previously Presented): Device according to claim 11 wherein radiation sources of different monochromatic wavelengths, whose radiation intensity $I_o(t, r)$ can be varied, are also used electively in an alternating fashion, depending on the sample and measurement tasks.

Claim 14 (Previously Presented): Device according to claim 11 wherein a measurement range can be controlled by thermostat and measurements can be carried out at selectable temperatures both under as well as over room temperature.

Claim 15 (Previously Presented): Device according to claim 11 wherein the multi-sample receptacle unit is designed as a rotor, and is driven by a motor with programmable variable and/or constant revolutions.

Claim 16 (Previously Presented): Device according to claim 11, wherein the multi-sample receptacle unit is capable of accepting samples placed vertically for segregation in the gravitational field.

Claim 17 (Previously Presented): Method according to claim 1, wherein the physical, technical method and/or colloidal chemistry parameter that is determined is selected from the group consisting of particle size, distribution of particle size, speed distribution, particle flux, hindrance function, index of structural stability and a combination thereof.

Claim 18 (Previously Presented): Method for an automatic determination of physical, technical method and/or colloidal chemistry parameters by a determination of an attenuation of radiated waves during a segregation of monodisperse or polydisperse dispersion samples subjected to gravitation or centrifugation, comprising, during the segregation by centrifugation or gravitation, repeatedly determining and recording momentary transmission values $I_T(t, r)$ characterizing a current segregation status of the waves radiated with intensity values $I_o(t, r)$ and/or instantaneous scattering values $I_S(t, r)$ as a function of a position r within the samples at a time t, for one or more wavelengths over the entire length of each sample or in selected partial sections of each sample, simultaneously for multiple samples.

Claim 19 (Currently Amended): Method according to claim 18, <u>wherein momentary transmission values $I_T(t, r)$ characterizing a current segregation status of the waves radiated with intensity values $I_o(t, r)$ are repeatedly determined and recorded,</u> further comprising calculating an extinction profile $E_T(t, r)$ by finding a log of a ratio of $I_o(t, r) / I_T(t, r)$ for a determination of a particle or droplet concentration for the dispersion samples as a function of sample position and time.

Claim 20 (Previously Presented): Method according to claim 18, further comprising, from the extinction profiles $E_T(t, r)$ determined at different times and a local adjustment made in time segments, calculating segregation speeds for any constant extinction values.

Claim 21 (New): Method according to claim 1, further comprising:

(e) calculating extinction-weighted distributions of the particle or droplet size from extinction profiles $E_T(t, r)$ for selectable times while standardizing on the maximum extinction for this profile.

Claim 22 (New): Method according to claim 1, further comprising:

(f) calculating the cumulative volume-weighted distributions of the particle or droplet size from any extinction profiles acquired at time t according to (b), wherein

(1) the volume-specific extinction cross section that is dependent on particle size is calculated according to Mie-theory while including the device constants from known optical parameters of the samples, or

(2) the volume-specific extinction cross section that is dependent on particle size is determined if the extinction of at least two monodisperse reference samples is determined corresponding to (b), or

(3) the volume-specific extinction cross section that is dependent on particle size is determined if the course of the extinction is determined during the segregation of at least one polydisperse substance system with similar optical characteristics corresponding to (b).

Claim 23 (New): Method according to claim 22, further comprising:

(g) using the volume-weighted distribution of particle or droplet sizes determined in (f) and the particle size dependency for the volume-specific extinction

cross section determined in (f)(1), (f)(2) or (f)(3), assigning each radial position and the particle size associated with it a volume concentration.

Claim 24 (New): Method according to claim 1, further comprising:

(h) determining the flux density function standardized to the centrifugation constant from the change in the concentration of the samples with known starting concentration.

Claim 25 (New): Method according to claim 1, further comprising:

(i) determining the concentration-dependent hindrance function for the substance system.

Claim 26 (New): Method according to claim 1, further comprising:

(j) determining the volume-weighted distribution of the Stokes equivalent diameter for the case of hindrance functions not equal to 1 until the difference between the concentration profiles of consecutive steps are less than a value to be provided in advance, or if the allowance for the hydrodynamic impediment is provided by a mathematical algorithm.

Claim 27 (New): The device according to claim 11, wherein the source produces monochromatic parallel radiation over the entire length of the sample.